Gas Analysis

Gas cooler series EGK 1 Ex2

In the chemical industry, petrochemistry or biochemistry, reliable process control relies on prompt and exact determination of the operating parameters.

Here, gas analysis is key for safe and efficient control of process flows, environmental protection and quality assurance. This benefits controlling flue gas emission in power stations or exhaust gas analysis in automotive engineering, as well as the efficient control of air separators or sterile production and packaging in the food industry.

Many of the analysis processes used in these fields require extracting the sample gas. This inevitably also extracts process-related contamination such as particles or moisture. These in turn can impact the measurement results or damage the measuring cells. The sample gas must therefore be conditioned before entering the analyser.

The EGK 1 Ex2 is ATEX and IECEx approved and is suitable for operation in explosive zones with up to 2 gas paths.

- Compact installation
- One or two gas paths
- Heat exchanger made from stainless steel, Duran glass and PVDF
- Bühler constant control system
- Self-monitoring
- Block temperature display
- Status alarm
- Rated cooling power 320 kJ/h
- Dew point stability 0.1 °C
- CFC-free
- Ex approved Zone 2

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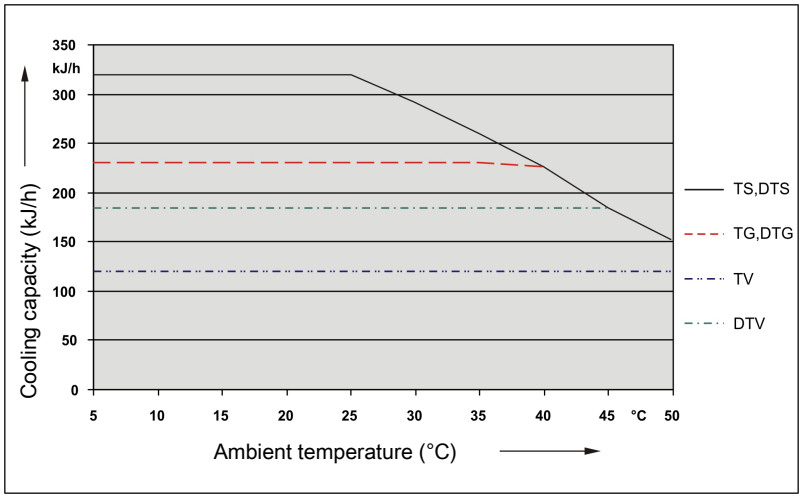
Please note for this device:

The equipment must be installed in a housing which at a minimum meets EPL Gc.

Performance data



Remark: The limit curves for the heat exchangers exchanger apply to a dew point of 65 °C.

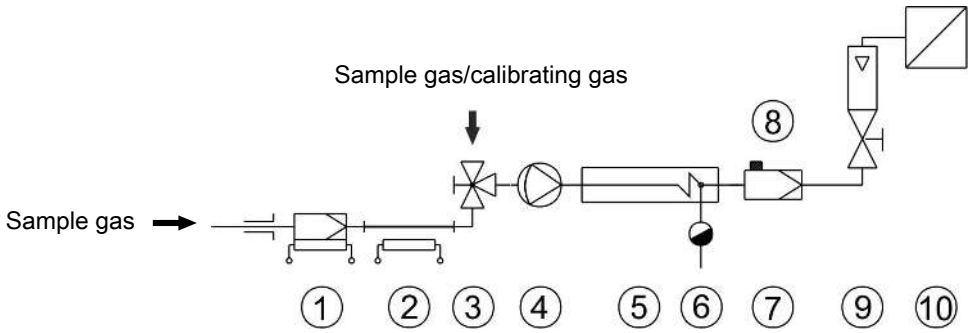
Gas cooler technical data

Gas Cooler Technical Data			
Ready for operation:	after max. 15 minutes		
Rated cooling capacity (at 25 °C):	320 kJ/h		
Ambient temperature:	5 °C to 50 °C		
Gas outlet dew temperature, preset:	approx. 5 °C		
Dew point fluctuations static: in the entire specification range:	 0.1 K ± 1.5 K		
IP rating:	IP 20		
Housing:	Stainless steel		
Packaging dimensions:	approx. 390 x 300 x 400 mm		
Weight incl. heat exchanger:	approx. 15 kg		
Electric supply:	115 V, 60 Hz or 230 V, 50 Hz Plug per DIN EN 175301-803		
Electrical data:		230 V	115 V
	Typical power input:	140 VA	155 VA
	max. operating current:	1.6 A	3.2 A
Alarm output switching connection:	max. 250V, 2 A, 50 VA Terminal plug per DIN EN 175301-803		
Installation:	stand-alone or wall-mounted, dry and dust-free		
Markings:	ATEX: Ⓔx II 3G Ex ec nA nC IIC T4 Gc IECEx: Ex ec nA nC IIC T4 Gc		
Applied standards:	IEC 60079-0 (Ed. 6.0); IEC 60079-7 (Ed. 5.0); IEC 60079-15 (Ed. 4.0) EN 60079-0:2012+A11:2013; EN 60079-7:2015; EN 60079-15:2010		
IECEx certificate number:	IECEx IBE 17.0023X		

Technical Data - Options

CPsingle Peristaltic Pumps Technical Data	
Flow rate	0.3 L/h (50 Hz) / 0.36 L/h (60 Hz) with standard hose
Vacuum inlet	max. 0.8 bar
Pressure inlet	max. 1 bar
Outlet pressure	1 bar
Hose	4 x 1.6 mm
Protection class	IP 40
Materials Hose: Connections:	 Norprene (standard), Marprene, Fluran PVDF

Diagram typical installation



1	Sample gas probe	2	Sample gas line
3	Reversing tap	4	Sample gas pump
5	Sample gas cooler	6	Automatic condensate drain or peristaltic pump
7	Fine mesh filter	8	Moisture detector
9	Flow meter	10	Analyser

See data sheets for individual component models and data.

Heat exchanger description

The energy content of the sample gas and the required cooling capacity of the gas cooler is determined by three parameters: gas temperature ϑ_G, (inlet) dew point τ_e (moisture content) and volume flow v. The outlet dew point rises with increasing energy content of the gas. The approved energy load from the gas is therefore determined by the tolerated rise in the dew point.

The following limits are specified for a normal standard operating point of τ_e = 65 °C and ϑ_G = 90 °C. The maximum volume flow v_{max} in Nl/h of cooled air is indicated, so after moisture has condensed.

If the values fall below τ_e and ϑ_G, the flow v_{max} may be increased. For example, on the TG heat exchanger the parameter triple τ_e = 65 °C, ϑ_G = 90 °C and v = 280 Nl/h may also be used in place of τ_e = 50 °C, ϑ_G = 80 °C and v = 380 Nl/h

Please contact our experts for clarification or refer to our design program.

Heat exchanger overview

Heat exchanger	TS TS-I [2]	TG TG	TV-SS TV-SS-I [2]	DTS (DTS-6 [3]) DTS-I (DTS-6-I [3]) [2]	DTG DTG	DTV [3] DTV-I [2] [3]
Version / Material	Stainless steel	Glass	PVDF	Stainless steel	Glass	PVDF
Flow rate v_{max} [1]	530 L/h	280 L/h	155 L/h	2 x 250 L/h	2 x 140 L/h	2 x 115 L/h
Inlet dew point $\tau_{e,max}$ [1]	80 °C	80 °C	65 °C	80 °C	65 °C	65 °C
Gas inlet temperature $\vartheta_{G,max}$	130 °C (180 °C) [5]	130 °C	130 °C	130 °C (180 °C) [5]	130 °C	130 °C
Max. cooling capacity Q_{max}	450 kJ/h	230 kJ/h	120 kJ/h	450 kJ/h	230 kJ/h	185 kJ/h
Gas pressure p_{max}	160 bar	3 bar	3 bar	25 bar	3 bar	2 bar
Pressure drop Δp (v=150 L/h)	8 mbar	8 mbar	8 mbar	5 mbar each	5 mbar each	15 mbar each
Dead volume V_{dead}	69 ml	48 ml	129 ml	28 / 25 ml	28 / 25 ml	21 / 21 ml
Gas connections (metric)	G1/4	GL 14 (6 mm) [4]	DN 4/6	6 mm tube	GL14 (6 mm) [4]	DN 4/6
Gas connections (US)	NPT 1/4"	GL 14 (1/4") [4]	1/4"-1/6"	1/4" tube	GL14 (1/4")[4]	1/4"-1/6"
Condensate out connections (metric)	G3/8	GL 25 (12 mm) [4]	G3/8	Tube 10 mm (6 mm)	GL18 (10 mm) [4]	DN 5/8
Condensate out connections (US)	NPT 3/8"	GL 25 (1/2") [4]	NPT 3/8"	Tube 3/8" (1/4")	GL18 (3/8") [4]	3/16"-5/16"

[1] Considering the maximum cooling capacity of the cooler

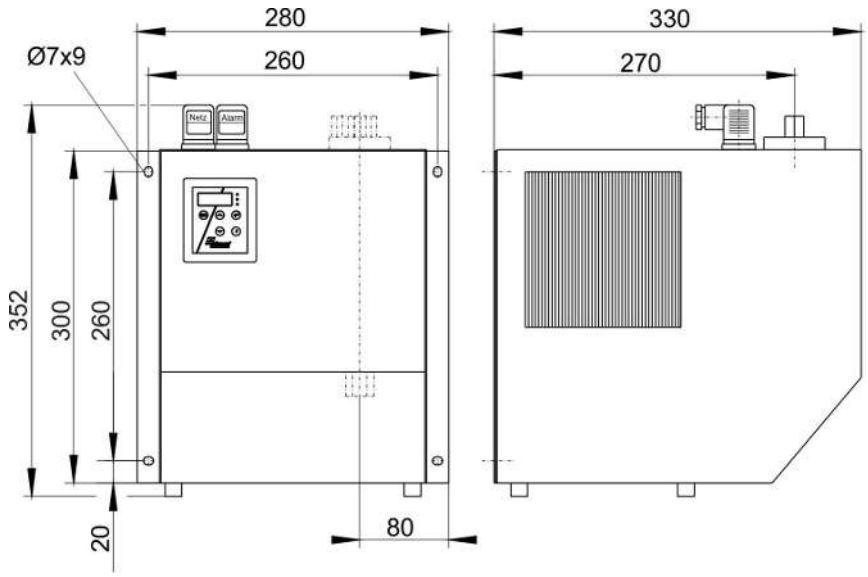
[2] Models marked I have NPT threads or US tubes, respectively

[3] Condensate drain only possible with condensate pump

[4] Gasket inside diameter

[5] With temperature class T3 gases the permissible gas inlet temperature is max. 180 °C.

Dimensions (mm)



Ordering instructions

Gas cooler

The item number is a code for the configuration of your unit. Please use the following model key:

Please note: Every individual gas path must be equipped with peristaltic pump or condensate drain.

4563	2112	X	X	X	X	X	0	0	0	Product Characteristics
										Voltage
		1								115 V, 60 Hz
		2								230 V, 50 Hz
										Heat exchanger
			1	1	0					1 gas path, stainless steel/ (TS), metric
			1	1	5					1 gas path, stainless steel/ (TS-I), US
			1	2	0					1 gas path, glass/ (TG), metric
			1	2	5					1 gas path, glass/ (TG), US hoses
			1	3	0					1 gas path, PVDF/ (TV), metric
			1	3	5					1 gas path, PVDF/ (TV-I), US
			2	6	0					2 gas paths, stainless steel/ (DTS), metric
			2	6	1					2 gas paths, stainless steel/ (DTS-6) [1], metric
			2	6	5					2 gas paths, stainless steel/ (DTS-I), US
			2	6	6					2 gas paths, stainless steel/ (DTS-6-I) [1], US
			2	7	0					2 gas paths, glass/ (DTG), metric
			2	7	5					2 gas paths, glass/ (DTG-I), US hoses
			2	8	0					2 gas paths, PVDF/ (DTV) [1], metric
			2	8	5					2 gas paths, PVDF/ (DTV-I) [1], US
						X				**Condensate drain** [2]
						0				without condensate drain
						1				Peristaltic pump CPsingle with 90° hose connection [2]
						2				2 peristaltic pumps CPsingle with 90° hose connection [2]
						3				Peristaltic pump CPsingle with screw-in hose connection [2]
						4				2 peristaltic pumps CPsingle with screw-in hose connection [2]

[1] Condensate outlets only suitable for connecting peristaltic pumps.

[2] Each gas path equipped with a peristaltic pump. The supply voltage corresponds with that of the main unit.

Consumables and accessories

Item no.	Description
44 10 00 1	Automatic condensate drain 11 LD V 38
44 10 00 4	Automatic condensate drain AK 20, PVDF *
44 10 00 5	Condensate trap GL 1; glass, 0.4 L *
441 00 19	Condensate trap GL 2; glass, 1 L *
4492 0035 011	Norprene replacement hose with straight connections for CP peristaltic pump 0.3 L/h
4492 0035 012	Norprene replacement hose with angled connections for CP peristaltic pump 0.3 L/h
4492 0035 013	Norprene replacement hose with one straight and one angled connection for CP peristaltic pump 0.3 L/h
4492 0035 016	Norprene replacement hose with one angled connection and one screw connection (metric) for CP peristaltic pump 0.3 L/h
4492 0035 017	Norprene replacement hose with one angled connection and one screw connection (US) for CP peristaltic pump 0.3 L/h
44 92 12 22 102	Peristaltic pump CPsingle-OEM-AC X2 with angled hose nipple
44 92 12 22 104	Peristaltic pump CPsingle-OEM-AC X2 with screw-in hose connection (metric)
44 92 12 22 105	Peristaltic pump CPsingle-OEM-AC X2 with screw-in hose connection (US)

*approved for non-flammable and flammable gases explosion class IIB.